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sented than this of Dr. Forbes. He might have fancied that he was presiding at the Geological Society, so admirable were the observations of Dr. Forbes upon the geology and structure of Vancouver Island. Whether it respected the geology, the meteorology, the botany, or the statistics of that island, all these were so well combined in this Paper, that he had much pleasure in calling upon the Meeting to return thanks to Dr. Forbes for his valuable communication. He should not request any gentleman to address the Meeting until after the next Paper had been read, as the two subjects were intimately connected; and then he would first call upon Captain Richards, under whose orders Dr. Forbes had obtained his knowledge, and who had himself made an admirable survey of Vancouver Island.

The second Paper treated of—

The Geography of British Columbia and the Condition of the Cariboo Gold District. By Lieut. H. S. PALMER, R.E.

LIEUT. PALMER mentioned that since the first discovery of gold in British Columbia in 1858, fresh deposits had gradually been traced farther and farther northward, till ultimately the well-known fields of Cariboo had been reached, 500 miles from the mouth of the Fraser. Entrusted with the task of a general survey, he details the geographical outline of the colony, the seaboard of which extends 500 miles, protected throughout almost its entire length by Vancouver and Queen Charlotte islands. This seaboard is indented in the most extraordinary manner by deep bays and arms of the sea, presenting an extent of sheltered inland navigation, and an actual length of shore-line, such as are nowhere equalled on any similar stretch of coast in the world.

The most marked physical feature of the country, viewing it from the shore inland, is the parallelism of two mountain ranges with an elevated intervening plateau of rolling country 100 miles in breadth. The coast-line of mountains is known as the Cascade or Coast range, 120 miles wide, the western slopes of which are covered with the most magnificent forest. Its sea-front is everywhere bluff and abrupt and quite close to the shore, except where the Fraser falls into the San Juan Fuca Sound, when it recedes some 40 miles. The eastern side of the range is drier, the trees more scattered, and the general profile less abrupt. The principal crest of this chain is about 5000 feet above the sea, a peculiar characteristic being the almost entire absence of peaks. The rivers on the east side are naturally longer and less impetuous than those on the west, but occasionally some of them rise on the plateau, and thread the mountains till they fall into the sounds. Above some of these, glaciers are said to have been seen; but nothing authentic seems to be known on this subject.

The scenery of the table-land, which is well suited for pastoral purposes, is described in high terms; the rivers having occasionally hollowed out for themselves channels of immense depth, in which occur splendid cascades, some of which are mere fissures, others are met with in broad-terraced valleys, or in vales of gently undulating slopes, covered with grass and picturesquely dotted with yellow pines. Here and there are pretty sheets of water, which, like the rivers, are well supplied with numerous kinds of fresh-water fish. Above 3000 feet, the grass, which gradually gets less nutritive with the increased elevation, gives place to a universal mantle of dwarf fir. Here farming has proved moderately successful at an elevation of 2100 feet, but Lieut. Palmer doubts whether a considerable time must not elapse ere enough grain can be raised in the more sheltered and well-irrigated valleys, to admit of its finding a market at the mines or settlements. At present the insects are a severe annoyance to man and beast, but these will probably recede before man. The west side of the Fraser is rather more elevated and the rivers are fewer, but the east side is the most pleasant and desirable part of the colony.

Just beyond begins the second mountainous range, which extends without a break to the watershed of the Rocky Mountains, which as far north as the Peace River, flowing eastward, forms the eastern boundary of the colony on this side. The only portion of this unexplored region where white men are to be met, is Cariboo.

The Fraser, which drains one-half the entire territory, has frequent stretches free from rapids, where steamers of small draught can run; while from Fort Alexander down to New Westminster there is now excellent communication, passing through the most sublime scenery. A marked characteristic of the Fraser, in which it differs from every other river, is that there is no lake throughout its course; the flow of water is rapid, and the waters consequently dark and muddy. Another peculiarity, in which it resembles the Mississippi, is that the frequent accession of considerable volumes of water from large tributaries does not perceptibly increase its width till it approaches its mouth.

Cariboo lies in the elbow formed by the upper waters of the Fraser, and is bounded on the south by the Quesnelle River. A marked phenomenon is the confused congeries of hills of considerable altitude, from 6000 to 7000 feet high, thickly timbered, whence subordinate ranges radiate as centres. Each valley thus formed is the bed of a stream of more or less proportions, from the tiniest, called "gulches" by the miners, which may be jumped over, to respectable-sized rivers. All these have long since been "pro-

spected," every creek having been discovered to be more or less the site of the richest deposits of gold. A circle of three miles radius from the top of Bald Mountain contains five creeks, two of which are the most notorious gold-beds in the colony. Snowshoe Mountain contains the headwaters of no fewer than six of these within a similar area, the streams in every case radiating to every point of the periphery. The views from the summits of these mountains are described as splendid.

After adverting to the prospects and past history of the diggings, the unfavourable accounts of which, and of the colony, he, like Dr. Forbes, traced to their true source in ignorance of physical geography and most unjustifiably sanguine expectations, the author reverts to the phenomena above noticed; whence he draws the conclusion that these mountains have supplied the gold, and that they are so many *foci*, as it were, of the precious deposit. If this be true, he concludes that, even as it stands, Cariboo will be found the richest and most inexhaustible gold-field on the globe. He then remarks a curious fact, that the intrinsic value of the gold washed out of the creeks varies greatly within a very few miles; the difference amounting in some instances to as much as 8s. per ounce.

A succession of auriferous deposits have been traced, following the general trend of the main chain of mountains extending from the southern boundary of the colony to the Peace River, *i. e.* over 7° of latitude, while the extremities so far as ascertained lie between the meridians of 119° and 122° w.

The winter of Cariboo appears to be much more severe and prolonged than that of the coast or Vancouver Island, and will much retard the development of the mines, which are accordingly during that season "laid over," as it is termed—*i. e.* the laws enforcing the mode of working them, &c., are remitted for the time. The thermometer sometimes falls to -35° c. (31° below zero of Fahr.), when of course nothing but underground claims can be worked. The thaw, which commences about April, renders Cariboo for a season anything but an enviable residence, owing to the rains and the steaming mists, while locomotion is all but impossible. In past years the trail at this season was loathsome from the numbers of horses that lay unburied after succumbing to the tremendous toil of conveying the first convoys of provisions.

Although for ten or eleven months in the year the country has a gloomy, cheerless aspect, August and September being the only bright exceptions, it is remarkably healthy. The sun is late of making his appearance, even in midsummer, owing to the hills enclosing the diggings on every side.

Of late 400 miles of excellent waggon-roads lead from Yale, the present head of steam-navigation, so that the entire distance from New Westminster to Cariboo can now be accomplished in from six to seven days. At the estuary of the Fraser, the author, in summing up, said that the winters somewhat resembled those of England, though the extremes were greater; and that the rainfall there is about 54 inches annually.

The PRESIDENT was glad Lieutenant Palmer had prefaced his account of the Cariboo Mines with a graphic description of the physical geography of the whole region. It was as clear an account in a small compass as he had ever heard given. The writer having alluded to himself, when speaking of the radiation of the gold-streams from the Bald Mountains, he had one observation to make. He hoped no gentleman would go away with the idea that gold *in situ* radiated after that fashion. These, as the author had explained, were only the streams that carried down the gold from the auriferous mountains in which it had been originally imbedded. The line which the gold-veins in the slaty rocks took, as laid down on the map by Lieutenant Palmer, was on the whole from North to South. Such too was the general line in the auriferous veins in Victoria, as delineated in the excellent maps of Mr. Selwyn; and the same remarkable fact occurred in the great continent of America. The great object of the two Papers was to put before the British public the truth respecting the geology, the geography, the climate, the minerals; and the advantages and disadvantages for colonisation of these regions. He was informed by Lieutenant Palmer that not more than one-third of the population of British Columbia was truly composed of British people; consequently, the Americans, who were very active miners, were putting a considerable portion of the gold into their own pockets, while our countrymen at home were not aware of the resources which awaited them there. In calling upon Captain Richards to speak to the merits of the first Paper, he took the opportunity of congratulating the Society upon the accession of so distinguished a naval surveyor as Captain Richards to the post of Hydrographer to the Admiralty, which had been so ably filled by the lamented Admiral Washington.

CAPTAIN RICHARDS, R.N., said he was happy to bear testimony to Dr. Forbes's Paper as conveying a very truthful idea of the country, and as affording a fair and not overdrawn picture of the prospects of intending emigrants to these colonies. Dr. Forbes was a distinguished geologist, and an accomplished general observer, and he had not failed in his endeavour to communicate to others the information he had gained during his long service in various parts of the world. He (Captain Richards) would particularly recommend the perusal of Dr. Forbes' Prize Essay on Vancouver Island to those who took an interest in that important colony; and he begged to add that it was with much pleasure and gratification he had listened to the high and well-deserved compliment paid to Dr. Forbes by their distinguished President.

After the Paper just read, it would be unnecessary for him to take up the time of the Meeting by any lengthened remarks on Vancouver Island, although, from having passed many years of his life in the exploration of its shores, he naturally felt much at home on the subject. It was evident that it was not destined to become a great agricultural country, though there were highly favoured spots of considerable extent which held out great encouragement to the farmer, and many of these were still unoccupied. But it was already a great commercial country, and daily increasing in importance. The rise of the British colonies in the North Pacific had not been, perhaps, so rapid, nor their resources

so speedily developed as those of the neighbouring countries to the southward ; still their progress had been rapid, steady, and was secure beyond a doubt. Vancouver Island was most important in a geographical point of view, and its value to Great Britain could not be overrated. It was the head-quarters of the naval power of England in the Pacific, and was already a great coal and timber producing country. It was not too much to say that its spars were the finest in the world, and, though it might not be generally known, were now supplied to most of the naval powers of Europe. The fisheries also in due course of time would prove a source of great wealth to the colony. They had long been known, and now that the survey of the sea-coast had been completed, and the seaman knew where he could run for safety and shelter, they would soon become developed.

As regards the sister colony of British Columbia, no one was better qualified to speak than his friend, Colonel Moody, of the Royal Engineers. He (Captain Richards) was well acquainted with its coasts, and many of the advantages possessed by Vancouver Island equally belonged to British Columbia. Some little rivalry, perhaps jealousy, naturally existed between two colonies in such close proximity to each other ; the one with a free port, the other dependent at present principally on its import duties for its revenue. But these would soon vanish. In his opinion, the two colonies would be mutually dependent on each other for their prosperity. British Columbia possessed a magnificent river, the Fraser, affording water-communication for 100 miles into the interior, with roads diverging to the different gold and agricultural regions, and which at no distant date would connect it with Canada. The tranquil character of this river, and its entire freedom from those dangers to which most others on this coast are subject, is entirely due to the position of Vancouver Island, so that a debt of gratitude is due to the smaller, though elder sister, on this account alone. He repeated that there should be no jealousy between the two colonies. Though mutually necessary to each other, their interests were widely different. British Columbia was a rich gold-bearing and extensive agricultural region, and would soon be second to no colony of Great Britain ; while Vancouver Island, from its admirable geographical position, must always be the great entrepôt of commerce, and was already a powerful rival of that great emporium of the Western world—San Francisco.

The PRESIDENT, in announcing that Colonel Moody, of the Royal Engineers, under whom Lieutenant Palmer served, and who had occupied a high station in the region under review, was present, said, he hoped that a person so intimately acquainted with the country would favour them with his views on the subject of British Columbia, and its value as a colony.

Colonel MOODY said, in reference to the last observation of Captain Richards respecting the two colonies, that there was not the slightest local feeling in the matter. Captain Richards was a most disinterested person, and nobody had done more than he to keep down any feeling of rivalry between Vancouver Island and British Columbia. There were one or two points in Dr. Forbes's Paper which he should like to remark upon. One was with reference to the terminus of the railway, which, no doubt, would come one of these days. Dr. Forbes spoke, not too strongly, of the importance of and the future of Nanaimo. It was destined to be a Newcastle, a Glasgow, a Birmingham, and a Swansea, all in one : it would be an important place for manufactures. It was the seat of the coal, and it was where all the ores that abounded along the coast both of Vancouver Island and British Columbia would be brought. It would be the most important manufacturing town in the North Pacific. With regard to Victoria and Esquimalt, their future was entirely commercial. Touching the point for the railway terminus, it appeared that there were three chief points known at present : Bentinck Arm, to the north ; then, Bute Inlet ; and then, the mouth of the Fraser River. There were other inlets and gulfs which pierced the mountain ranges, and some of these might

afford opportunities for penetrating into the interior. For a railway terminus, however, Bute Inlet presented great difficulties. No doubt a good road would be made there some day; but he thought the terminus of railway communication would be, not at Bute Inlet, but at the mouth of the Fraser. There was really no other good line of country through which a railway could be carried, and from the reports he had received, and from what he had seen, he was happy to believe there were no physical difficulties which our engineers could not overcome in carrying a line of railway over the Rocky Mountains down to that part of the coast. Another point was—and as a soldier they would forgive him if his ears pricked up at hearing it—that the island of San Juan was not of military importance. It would be of military importance if it were fortified. If the Americans held possession of it, and left it as it was, it would be of no moment; but, if they should fortify it, they might make it a serious difficulty to us, for it would enable them to a great extent to command the passage to the mainland. He regretted to see the expression “the disputed island of San Juan” slipping into the newspapers both in England and America; for it was not that island alone, but the whole archipelago that was involved in the question. With regard to the pine-forests, there were very valuable pines on the coast of British Columbia and in the interior. The value of the timber could scarcely be exaggerated; great quantities would be sent to China, and much might be brought home. The size of the trees was extraordinary. He had measured numbers, and he made out that the average of the Douglas pine ranged somewhat over 300 feet in height. One or two measured 320 feet to where the top branches had been broken and splintered off by the trees falling; and where he left off measuring, the tree was as thick round as his waist. Settlers looked upon these trees with abhorrence, because of the difficulty of clearing the ground which they entailed; but the day would come when the trees would find their market value. On one occasion he was out riding with Governor Douglas, and they came upon the ruins of a great cedar-tree. Governor Douglas got off his horse, and, with a 3-foot rule, he measured the trunk about 5 feet 6 inches above the ground; and, although the bark had been burnt off, the tree measured 57 feet in circumference. This would give some idea of the vastness of these trees. According to an article in the ‘Gardener’s Chronicle,’ based upon the meteorological journals kept in their camp, the climate round New Westminster might be compared with that of Chiswick; a greater quantity of rain fell, but there were not more rainy days; and the general character of the climate was as near as possible like that of Chiswick. Occasionally the winters were severe. The winter he was there was such a winter as we occasionally have in England when the Thames is frozen over. It is a thorough grain-ripening country. The farmer would rejoice in it, because almost every year he would be safe in getting in his hay and wheat crops. The seasons are well and clearly marked. There is no jump from winter to summer, as there is in Canada; but a regular winter, spring, summer, and autumn. There is a great deal of rain in the latter part of the year, and some fog in the winter. There is an absence of east wind, and, on the whole, it is a climate most suitable for a Briton. The healthiness of the country is something remarkable. These observations referred to the neighbourhood of New Westminster. British Columbia consisted chiefly of plateaux of different degrees of elevation; accordingly, there were many varieties of climate. Beyond the Cascade Range you get quite a different description of climate, where there is very little rain, and where it is very hot; the thermometer ranging to 90° and 95°, and sometimes to 100° in the shade. A certain description of *cacti* flourished there; rattlesnakes were found among the rocks, grapes ripened fully, and grain was winnowed in the open air. Though the winters are cold, cattle and sheep seem to thrive there; and, as there is not much wind, the sensation of cold is not felt. The bunch-grass rises above the average depth of snow, so that cattle can feed out of doors in the winter. It is

a common thing for the Indians and the packers, who take goods up to Cariboo, to send their horses to graze here in the winter, though the climate is much colder than it is in New Westminster. The character of the plateaux is very remarkable; they range from 2,000 to 3,000 feet high above one another, and when you are upon them, you are not conscious that you are upon mountain land. Another remarkable feature is that the principal valleys and the secondary valleys crossing them are rhomboidal, and the western escarpments are upheaved, so that they slope slightly to the east and upwards to the north. Thus they are placed *en échelon*, like columns of troops; they are not in a continuous series, but, in this *en échelon* form, ascending northwards.

There was another striking peculiarity which distinguished British Columbia from Vancouver Island. In Vancouver Island there is a great deal of rich black mould lying on a stiff clay; in British Columbia the general character of the soil is a light sandy loam. In summer time it is quite light; in winter you are conscious of a greasy feel, your feet slip in it. It is more like a barley soil in England than anything else. Under the application of the most ordinary operations of industry, with irrigation, the soil springs into the utmost fertility immediately, and the yield is abundant. Another singular feature is, that there is a line of soil running obliquely across the country in a north-easterly and south-westerly direction. On one side of that line you have the bunchgrass and the *Pinus ponderosa*, while on the other side of the line you have neither the one nor the other. This line follows the rhomboidal arrangement of the valleys that he had alluded to; and it is so remarkable that he requested his officers to note it whenever they came across it, and their reports showed that the line was as straight as possible. With respect to the future of the two colonies, he would take the opportunity of saying that the advance of one contributed to the advance of the other. Vancouver Island depended entirely upon maintaining its free port; it was adapted eminently to be the great commercial depôt of the North Pacific, and it could only be that for many years to come by maintaining its free ports. In like manner from the circumstance of Nanaimo being so well supplied with coal, and possessing a harbour so easily accessible, it, too, was destined to be a great manufacturing place. He considered Nanaimo the manufacturing capital, and Victoria the commercial capital of Vancouver Island. Vancouver Island could do with a very small revenue. British Columbia, on the other hand, required a large revenue, on account of the great public works that were required. She intended to carry out these works herself, but at present she required a loan from the old country, which no doubt would be repaid. The great works at present carried out had been achieved by Americans and Canadians. The contractors, who were Americans, borrowed the money in San Francisco. The Americans were eminently a pushing race, and he would take this opportunity of saying that the Americans were among the best subjects of Her Majesty in British Columbia. He for one should be very sorry, indeed, were they to withdraw. He believed that a great deal of the gold got out by the Americans was permanently invested in British Columbia, and that it was the intention of the Americans to become permanent residents there with their children. All that the country needs is greater confidence in her at home, and a more liberal, yet judicious, laying out of capital to develop her resources.

Lieutenant PALMER, having been asked by the President to narrate his experience among the natives, said, many reports had appeared in print as to the natives being murderous, yelling savages; but he could assert that such reports were mostly untrue. It could not be denied that sometimes the natives, exasperated by interference with their lands, their customs, and superstitions, had committed dreadful crimes; but they had become debased and degraded by the vices which they had learned from the white man. They were not by nature a blood-shedding people. He had travelled all through the

country, and he only once met with interference from them. When near the coast he gave unintentional offence to the natives with regard to their rights about the salmon. They became so troublesome that he had to expel two or three of them from the camp. He had no sooner done so than twenty or thirty who were sitting round rushed off to their lodges, and returned with an extraordinary collection of old fire-arms, all loaded and primed, and pointed at him. Knowing the character of the natives, he thought the best way was to approach them unarmed. They did not take their arms down, but they consented to enter into an argument, and then he felt sure he should soon persuade them that they were wrong. He succeeded in this; peace was declared, and he had to shake hands with the whole tribe, squaws and all. They became friends, and the leader of the tribe became a great friend of his, and was of great assistance in guiding him through the country. Before the termination of the ride, they were so pleased with him that they used their best endeavours to get him and his companions married into the tribe. As a general rule they respected "King George men." "King George" was the name in which in olden times the Hudson Bay Company impressed upon them the existence of a great white chief, George III., and since then the natives have ever recognised the British people as King George men. He found that by calling himself a King George man, or wearing a bit of King George lace, or saying that he was a friend of King George, he got them to assist him. They were a very harmless race, and he believed in a few years they might be improved, and made a peaceful people. At present they were still degraded. As faithful guides through the forest, and untiring bushmen, they were worthy of a great deal of our admiration.

The PRESIDENT, in conclusion, congratulated the Society upon the great amount of useful knowledge which had been elicited respecting British Columbia and Vancouver Island, and adjourned the Meeting to the 11th of April.

ADDITIONAL NOTICES.

(Printed by order of Council.)

1.—*Extracts from Correspondence between M. ROHLFS GÉRARD and the Council.*

- I. *Translation of Extract from a Letter addressed to Sir Roderick I. Murchison, President of the Royal Geographical Society, from M. ROHLFS GÉRARD, dated Oran (Algeria), 18th December, 1863, requesting pecuniary aid for a proposed journey from Morocco to Timbuctu.*

"Oran, 18th December, 1863.

"On my return from a tour in the direction of Morocco and the deserts of that empire, of which I traversed the provinces of Sus, Oued-Draa, the Tafilet, Ertib, and Figuig, an account of which series of travels has been published by Dr. Petermann on one hand, besides being reproduced by M. Berbrugger,* editor of 'La Revue Africaine,' which appears at Algiers, I am at present preparing to start once more for the interior; and having, on what I may call my preparatory travels, obtained the necessary acquaintance with the manners and customs of the natives, I look forward to penetrating as far as Timbuctu.

* Now Honorary Corresponding Member, Royal Geographical Society.